

REMARKS

Claims 1-11 are pending in the present Application. Claim 1 is independent.

Claim Rejection – 35 U.S.C. 103; Zimmermann, Nayar and Juday

Claims 1-4 and 7-11 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmermann (U.S. Patent 5,185,667), Nayar (U.S. Patent 5,760,826), and Juday et al. (U.S. Patent 5,067,019, hereinafter “Juday”). Applicants respectfully traverse this rejection.

Claim 1

Claim 1 recites, among other things, an omniazimuthal visual system comprising an “image transformation section” which includes

“an arithmetic/logic circuit for performing coordinate transformation of a polar coordinate when the image data is transformed into the display data as a rectangular coordinate with reference to a lookup table of a trigonometric function” [Emphasis added]

The Examiner continues to allege that Juday teaches the claimed lookup table of a trigonometric function. First of all it is noted that the claimed lookup table is part of an image transformation section that transforms image data represented by polar coordinates into display data represented by rectangular coordinates. Juday on the other hand is directed to a transformation section that converts image pixels arranged in a first Cartesian matrix into output pixels

arranged in a second Cartesian matrix (Juday's claim 1 at column 18, lines 1-7). Thus, Juday is not directed to the same image transformation function as the present invention.

The Office Action, in a section "Response to Arguments", points to several sections in Juday in order to show that Juday teaches the claimed lookup table. In particular, the Office Action points to a section of the claims at column 18, lines 53-65 (Juday's claim 4). Juday's claim 4 is dependent on independent claim 1 and pertains to "look-up table sets". The Office Action points to related detailed description in Juday's specification at column 12, line 43, to column 14, line 39, in arguing that the look-up table sets pertain to trigonometric functions.

Even given the teachings in these sections of Juday, nowhere does Juday disclose a lookup table of a trigonometric function. As can be seen in Juday's claim 3, for example, the claims merely cover lookup tables of addresses and corresponding weighting factors. The conclusion that Juday's claims teach a lookup table of a trigonometric function since the lookup tables 34 and 36 perform functions of sine, cosine or tangent (Office Action at page 7, lines 13-16) is based solely on knowledge gained from Applicant's own disclosure, i.e., impermissible hindsight.

The equations at columns 12, 13, and 14 of Juday relied on in the Office Action are "solved off-line to determine the tables that drive the Remapper 10 as described above." (statement bridging columns 13 and 14).

Juday's Remapper 10 includes a Collective Processor 22 and an Interpolative Processor 22 in which look-up tables are determined off-line and stored in memory (Juday at column 6, lines 1-11; see also Juday's claim 1).

Juday clearly describes the lookup tables in each of the processors. The Collective Processor includes an Address Look-up Table 34 and a Factor Look-up Table 36 (Figure 3). The Interpolative Processor also includes a Weight Factor look-up table and Address Look-up Table 56 (Figure 4). Further detail of these processors is shown in Figures 5A and 5B. As stated in the section "Brief Description of the Drawings", Figures 5A and 5B schematically illustrate the hardware implementation of the programmable remapper of FGIS 2, 3, and 4. In Figure 5A for the Collective Processor, the Factor Look-up Table is shown as 36A and 36B, and the Address Look-up Table is shown as 34A and 34B. In Figure 5B for the Interpolative Processor, the Factor Look-up Table is shown as 56D, and the Address Look-up Table is shown as 56C. Juday's "factor look-up table" 36 is of weighting factors and "address look-up table" 34 is of addresses.

Thus, Applicants submit that Juday is clear with respect to its teaching of lookup tables and none of the disclosed look-up tables are of a trigonometric function.

Thus, given the combination of Zimmermann, Nayar, and Juday, the claimed "a lookup table of a trigonometric function" in the context of an image transformation section for transforming image data represented by polar

coordinates into display data represented by rectangular coordinates is not taught or suggested. Because not all claimed elements are taught or suggested by the subject references, either alone or in combination, the rejection fails to establish *prima facie* obviousness. Accordingly, Applicants respectfully request that the rejection be withdrawn.

Applicants have also argued that even if one of ordinary skill in the art were to consider the combination of Zimmermann, Nayar, and Juday, the combination would render Zimmermann inoperable for its intended purpose, and thereby teaches away from the combination. In re Gordon et al., 221 USPQ 1125 (CAFC 1984); M.P.E.P. 2143.01. With respect to this argument, the Office Action states that one of ordinary skill would be motivated to combine Juday and Zimmermann because they both use a camera to capture image and transform it into image data. Applicants submit, however, that the image transformation disclosed in each of Juday and Zimmermann significantly differ between the two references.

Applicants submit that it would not be a simple matter of replacing the transformation processor of Zimmermann with the remapper 10 of Juday. Zimmermann's transformation involves transformation of an object space into an XY image space. Juday's transformation does not pertain to transformation of an object space. Rather Juday's transformation applies to transformation of the image space. For example, Juday discloses that a panning transformation can be performed that moves data to create the effect that a camera were moved around.

The camera does not actually move (column 15, lines 34-42). In other words, Zimmermann's system is for omnidirectional image viewing, while Juday's system is for performing transformations on image data captured by a camera. Thus, Applicants submit that replacing Zimmermann's transformation processor with Juday's remapper would result in a viewing system that cannot perform omnidirectional image viewing, thereby rendering Zimmermann's system inoperable for its intended purpose.

Furthermore, if Zimmermann's system were to be modified to provide a function of warping an image as taught in Juday, as is alleged in the Office Action, Zimmermann's system would lose its capability of omnidirectional viewing. In other words, by making the combination suggested in the Office Action, Zimmermann's omnidirectional viewing system would be modified to be that of Juday's system, not an improved omnidirectional viewing system.

Thus, for these additional reasons, Applicants submit that one of ordinary skill would not have been motivated to combine the teachings of Zimmermann, Nayar, and Juday to obtain the invention of claim 1. These arguments apply as well to the dependent claims 2-11.

Claims 4, 10, 11

Further with respect to claim 4, because Zimmermann's technique involves non-linear operations (e.g., equations 17 and 18), it does not teach or suggest transformation using only linear functions.

Further with respect to claims 10 and 11, Applicants submit that neither Zimmermann nor Juday teach circuits that perform alternative functions and that only require changing one or two, respectively, parameters to perform each of the alternative functions.

Thus, for at least these additional reasons, the rejection fails to establish *prima facie* obviousness for claims 4, 10, and 11.

Accordingly, Applicants respectfully request that the rejection be withdrawn.

Claim Rejection - 35 U.S.C. 103; Zimmermann, Juday, Nobutoshi

Claims 5 and 6 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmermann, Nayar, and Juday as applied to claim 1 above, and further in view of Nobutoshi (JP 06-295333).

Nobutoshi would not motivate one of ordinary skill to use only linear functions in Zimmermann.

Nobutoshi does appear to teach an optical system having a hyperboloid mirror, but does not teach an image transformation section that uses only linear

functions and that can be implemented using a look-up table for a trigonometric function. Also, Nobutoshi does not teach the claimed "rotation axis" since its mirrors are not rotatable. Thus, Nobutoshi fails to make up for the deficiency of Zimmermann of using only linear functions, and in particular, capable of being implemented using a look-up table. Thus, Applicants submit that the rejection fails to establish *prima facie* obviousness.

CONCLUSION

In view of the above remarks, reconsideration of the rejections and allowance of each of claims 1-11 in connection with the above-identified application is earnestly solicited.

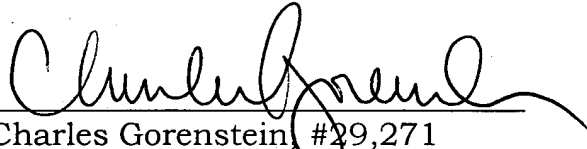
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert W. Downs (Reg. No. 48,222) at the telephone number of the undersigned below, to ***arrange for an interview*** in an effort to expedite prosecution in connection with the present application.

Appl. No. 09/846,297

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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